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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,147	11/29/2000	Matti Halme	BER-015	2942

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EXAMINER

NGUYEN, ALAN V

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 03/11/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/727,147

Applicant(s)

HALME, MATTI

Examiner

Alan Nguyen

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Data Transmission Control and Performance Monitoring Method of an IPSec link in Virtual Private Networks".

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11, 14, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding **claim 11** it is unclear as to which "network node" is being referred to on line 12. Regarding **claim 14** it is unclear as to which "network node" is being referred to on line 34. Regarding **claim 18** it is unclear as to which "network node" is being referred to on lines 21 and 30.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-3, 6-8, 11-13, 14-16, 18, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Chiu et al (US 6,526,022) hereinafter Chiu.

Regarding **claims 1-3, 6, 7, 11, 12, 14-16, 18, and 19** Chiu discloses congestion and flow control system that includes a method, software (***system must inherently have software to execute the required processes***) and a network node ("***sender***" is ***a source node in the network; figure 1, element 102***) for communicating with the IPSec protocol (***column 35, lines 30-36 discloses the use of IPSec technology as a way to perform sender authentication***) with a second network node ("***member/receiver***" is ***a destination node in the network; element 110-11***) via a communication link (***see figure 1***), the network node comprising at least

means for transmission of an acknowledgement packet if at least one of a first condition and a second condition is fulfilled,

first condition being the reception of at least a predetermined number of IPSec packets after transmission of the previous acknowledgement packet (***column 16, lines***

63-67 discloses that receivers send acknowledgements, ACK, after every 32 packets), and

second condition being the reception of a packet via the communication link after a predetermined time has passed after transmission of the previous acknowledgement packet (**column 17, lines 7-15 discloses that an ACK is sent by the receiver after a interval of 1.5 times the estimated ACK interval expires, which is 48 packets),**

means for receiving acknowledgement packets for IPsec packets transmitted by the network node,

means for obtaining a sequence number of an IPsec packet from a received acknowledgement packet, means for obtaining a value from the acknowledgement packet, said value corresponding to the amount of data received via the communication link by the second network node, and means for determining the packet success rate of the communication link at least partly on the basis of said value (**column 17, lines 21-42 discloses that each ACK message sent from the receiver to the sender contains a sequence number and a bit map length. For example, if there are one or more missing packets, the start sequence number indicates the first missing packet. A bit map must follow. Each bit in the map represents a packet sequence number starting with the start sequence number. If the bit is set, then that packet is missing and must be retransmitted. When the repair head receives an ACK message with a missing packets bit map, the sequence number specified minus 1 is saved for this member. This indicates that all packets prior to and including this sequence number have been received successfully. The repair head then**

scans the bit map looking for missing packets. According to the explanation above the sender obtains from the ACK message every single received and missing packet. This corresponds to and is indicative of the amount of data received. Regarding the success rate, column 37, lines 35-55, and column 38, lines 1-7 discloses the sender can calculate the total size of the data that is being transferred. The sender obtains the success rate and throughput based on the count of missing packets as disclosed above and total packets sent).

Regarding **claims 8 and 13** with the features of parent claims 1 and 11 addressed above Chiu discloses a method and network node further comprising at least the steps of a means for storing the sequence number and the transmission time of each IPSec packet transmitted by the network node via the communication link, and means for determining the round trip time of the communication link on the basis of the reception time of an acknowledgement packet and the stored transmission time of the corresponding transmitted packet ***(column 3, lines 51-54 discloses that in the transmitter a cache of already transmitted packets is maintained, including the sequence number of each. Column 12, lines 65-67 and column 13, lines 1-7 discloses that at the sender, packets are scheduled for transmission according to a pre-determined rate. This is achieved by injecting the right amount of sleep time between packet departures so that the average data rate matches the predetermined rate. After each packet transmission, the sender computes a time spent value, a packet size value and a rate. With this value the sender can also***

calculate the round trip time when the acknowledgment packet from the receiver arrives).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 5, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu in view of Jorgensen (US 6,680,922).

Regarding **claims 4, 5, and 17** with the features of parent claims 2 and 15 addressed above Chiu discloses where the acknowledgement packet comprises a packet counter value indicating the number of packets received (*column 17, lines 21-42 discloses that each ACK message sent from the receiver to the sender contains a sequence number and a bit map length. For example, if there are one or more missing packets, the start sequence number indicates the first missing packet. A bit map must follow. This indicates that all packets prior to and including this sequence number have been received successfully. The repair head then scans the bit map looking for missing packets. According to the explanation above the sender obtains from the ACK message every single received and missing packet. This corresponds to and is indicative of the amount of data received*).

Chiu, however, fails to expressly disclose where the acknowledgement packet comprises a byte counter value indicating the number of bytes received via the communication link.

Jorgensen discloses a VPN over a wireless PTMP transmission system utilizing IPSec as the method of security encryption (**see column 46, lines 6-8**) that at the sending end, the insertion of a byte count header on information that is delivered to the IP protocol layer and is encapsulated as part of the packet. The receiving end, when it gets packets is responsible for re-sequencing the packets and ensuring its accuracy. If all of the IP flow is not received correctly, the byte count_acknowledgment message can be sent back to the sending end, prompting the sending end to resend the bytes necessary to fill in the remaining portions of the packet flow. Additional packets are buffered until after resending the packet (**see column 31, lines 50-61**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chiu's apparatus to include in the acknowledgment messages a byte counter, as taught by Jorgensen. The motivation is an improvement in the accuracy and reliability of the system. Instead of accuracy to the packet level, the system will be accurate to the byte level, as explained by Jorgensen on column 31, line 55.

8. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu in view of Tam (US 6,622,172).

Regarding **claims 9 and 10** Chiu discloses a method for monitoring of a plurality of communication links between a source network site and a destination network site, each of the sites having at least one network node, in which method an active communication link is monitored, said method comprising at least the following steps for monitoring an active communication link between the source network site and the destination network site, the active communication link employing the IPSec protocol the step of transmission of an acknowledgement packet by the destination network node if at least one of a first condition and a second condition is fulfilled, said first condition being the reception of at least a predetermined number of IPSec packets after transmission of the previous acknowledgement packet (**column 16, lines 63-67 discloses that receivers send acknowledgements, ACK, after every 32 packets**), and said second condition being the reception of a packet via the communication link after a predetermined time has passed after transmission of the previous acknowledgement packet (**column 17, lines 7-15 discloses that an ACK is sent by the receiver after a interval of 1.5 times the estimated ACK interval expires, which is 48 packets**). Chiu also discloses determining the packet success rate of the communication link from the number of said received response packets (**column 17, lines 21-42 discloses the repair head then scans the bit map looking for missing packets. The sender obtains from the ACK message every single received and missing packet. This corresponds to and is indicative of the amount of data received. Regarding the success rate, column 37, lines 35-55, and column 38, lines 1-7 discloses the sender can calculate the total size of the data that is being**

transferred. The sender obtains the success rate based on the count of missing packets as disclosed above and total packets sent.) Chiu also discloses a means for storing the sequence number and the transmission time of each IPsec packet transmitted by the network node via the communication link, and means for determining the round trip time of the communication link on the basis of the reception time of an acknowledgement packet and the stored transmission time of the corresponding transmitted packet *(column 3, lines 51-54 discloses that in the transmitter a cache of already transmitted packets is maintained, including the sequence number of each. Column 12, lines 65-67 and column 13, lines 1-7 discloses that at the sender, packets are scheduled for transmission according to a pre-determined rate. This is achieved by injecting the right amount of sleep time between packet departures so that the average data rate matches the predetermined rate. After each packet transmission, the sender computes a time spent value, a packet size value and a rate. With this value the sender can also calculate the round trip time when the acknowledgment packet from the receiver arrives)*

Chiu, however, fails to expressly disclose where an inactive communication link is monitored, the method comprising at least the following steps for monitoring an inactive communication link between the source network site and the destination network site:

transmitting a probe packet from a source node at the source network site via said inactive communication link to a destination node at the destination network site, storing the transmission time of said probe packet in a memory means,

transmitting a response packet from said destination node to said source node as a response to receiving a probe packet,

determining the round trip time of said inactive communication link from the difference of the reception time of the response packet and the stored transmission time of the corresponding probe packet.

Tam discloses a packet transmission system utilizing TCP/IP that uses a probe packet to measure the round trip time of a communication link that is inactive at the time *(column 11, lines 45-60 discloses on figure 2 that a Round Trip Time Estimation module 12 uses a probe packet (PROBE) transmission and return paths 22, 24 shown in isolation from the DAT arrival path 26 and the ACK transmission path 28. In practice, the paths share the same input/output (hereinafter known as I/O) resources in the TCP communication protocol 10. That is, the ACK transmission path 28 shares the same I/O resource as the PROBE transmission path 22 and the DAT arrival path 26 shares the same I/O resource as the PROBE return path 24. Hence, to each of the other communication protocols that interact with the TCP communication protocol 10, there is only one transmission I/O resource and only one arrival/return I/O resource).*

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chiu's apparatus to include the use of a probe packet to monitor roundtrip times and packet success rates of inactive communication links, to complement the already disclosed method of monitoring active communication links, as taught by Tam. The motivation is an improvement in the accuracy and reliability of the

system. Instead on not knowing the basic parameters of an inactive communication link, the use of a probe packet can help in reducing packet errors and timing issues for links in a TCP/IP system, as explained by Tam on column 11, lines 45-50.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patent is cited to show the state of the art with respect to flow control and data monitoring

US Patent (6,674,713) to Berg et al

US Patent (6,446,200) to Ball et al


IEEE article to Tuquerres et al

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Nguyen whose telephone number is 703-305-0369. The examiner can normally be reached on 9am-6pm ET

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 703-305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AVN
March 4, 2004



RICKY NGO
PRIMARY EXAMINER